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ABSTRACT

The Core Skills Project has developed in the "core skills" an instrument that can be used in the analysis of occupational competence. Any development of accreditation of work-based learning entails assessment of learning in the workplace. The success of such assessment depends on identifying the outcomes of experience in terms of competence and the work role of the learner. A linkage needs to be found between the raw observation or measurement of the individual events of a learner's program and the eventual interpretation of a certificate plus supporting evidence. The means chosen by the Core Skills Project has been to describe skills used in any situation in a way that could be related to any other. The core skills have been defined as being common to a wide variety of tasks and essential to carrying out those tasks. They are particularly important in helping to deal with two of the problems involved in using the workplace as a source of assessment information--difficulty of generalization and inequality of opportunity. The analytical and descriptive capacity of the core skills enables the significant workplace element within the Youth Training Scheme to be part of a coherent accreditation system. (YLB)

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SANDWICH COURSES

THE ASSESSMENT OF STUDENTS ON PLACEMENT

Tuesday, 23 September 1986

YTS CORE SKILLS AND THE ACCREDITATION OF WORK BASED LEARNING

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THE CORE SKILLS PROJECT AND YTS

One of the projects which has contributed in a major way to the development of the Youth Training Scheme (YTS) is the Core Skills Project, funded jointly by the Manpower Services Commission and the European Social Fund. The project ran for three years until the end of 1985, and its concerns included the design and delivery of work based learning programmes and their recognition. The principle instrument which it developed for these purposes is the core skills framework which will be introduced in this paper.

The Youth Training Scheme, now a two year programme of training with a decidedly occupational focus, includes a considerable variety of provision. It caters for 16 - 18s of a wide range of ability. In common with the rest of the government's New Training Initiative YTS is instituting new approaches to the recognition of achievement within the vocational education and training system.

Despite the vested interests of existing institutions, an attempt is being made to accredit occupational competence 'as found'. Irrespective of the processes by which someone achieved competence, they should be credited with it. In particular, achievement in the workplace is being given proper weight after years in which its status has been indiscriminately lower than that of theory-led, academic achievement. One of the features of the YTS experience so far has been its enlightenment of many employers. They have recognised that trainees (many of whom would otherwise have been rejected for low educational attainment) achieve rather well when not forced down circuitous and formal routes of learning.

Accreditation in YTS could, if judged on only these grounds, be mistaken for just a warm, cosy, liberal recognition that learning has occurred in the oddest of places and for the most unpromising candidates. There is, however, more to it than that. It is not simply a change of fashion - the

replacement of further education or other off-the-job provision within occupational training. The key development is the integration of workplace achievement into accreditation which previously recognised only formal on-the-job and off-the-job training. (In many cases, of course, no accreditation was offered at all.) The desired outcome of this integration can be styled the 'accreditation of work based learning'.

Quite clearly, the problems of assessment within YTS are not identical to those of assessment in sandwich courses. They do, however, have much in common. In particular, where sandwich courses have 'relevance' or 'application' as part of their rationale, they share with YTS certain tensions in assessment. How, for example, can achievement in the specific activities of a placement be set alongside the attainment of more general understanding? How can the unanticipated and unplanned events of the workplace be reconciled to a structured, controlled programme of learning? And what is it important to assess in a placement anyway?

The work of the Core Skills Project has been concerned with these issues. It has examined the nature of work based learning and has identified key issues in its accreditation. It has developed in the 'core skills' an instrument which can be used in the analysis of occupational competence and in the design and control of programmes which recognise the workplace, with all its uncertainties, as an irreplaceable source of learning opportunities.

THE NATURE OF WORK BASED LEARNING

In the definition used in the Core Skills Project (Levy, 1986), work based learning is defined as learning linked to the work role of the learner through:

> "three inter-related components, each of which provides an essential contribution to the learning process. these three are concerned with:
>
> - structuring learning in the workplace;
> - providing appropriate on-job training/learning opportunities;
> - identifying and providing relevant off-job learning opportunities."

The definition is, deliberately, open in a number of respects. In particular, 'work role' is used rather than the narrow concept of 'job' or the broader one of 'occupation'. Work based learning may be broad or narrow at need, and it is a matter of policy and programme design as to where the emphasis should lie. For YTS, work role was certainly

intended to mean something more than an individual job or set of tasks. The difficulty of predicting where many trainees might end up suggested a need to help them keep their options open, to help them interpret their learning in the wider context and to encourage potential employers to recognise this.

Work based learning is sometimes thought to be a poor relation of education based models. Such a belief may be based on an underestimation of the value of learning in the workplace. Certainly, dismissal of 'mere experience' is often contradicted by complaints about learners inability to deal with problems in the real world and by assumptions that for competence in any activity one needs to be 'experienced'. Any development of accreditation of work based learning entails assessment of learning in the workplace.

The success of such assessment depends on identifying the outcomes of 'experience' in terms of competence and the work role of the learner. It is not enough to have a gut feeling that experience is a good thing.

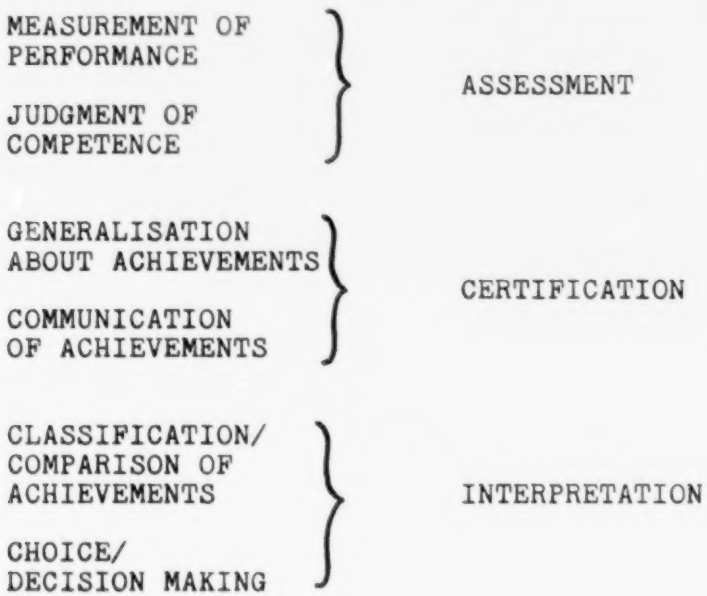
PROCESSES OF ACCREDITATION

Assessment in the workplace can be seen as contributing to assessment of the whole of work based learning. But assessment has a role in the enhancement and control of learning and (as will be considered here) is a component of accreditation.

Accreditation is all too often treated as a set of 'assessments' with a formal statement of achievement (certificate) related in some way to the outcome of the 'assessments'. Discussion of accreditation is confined to the merits or otherwise of assessment 'techniques' - a test, an examination, a rating scale, a format for reporting - in each case a magic formula for achieving respectability. The resulting accreditation represents the triumph of the easy-to-measure over the useful-to-know.

Accreditation is a closely interrelated system involving the processes shown in Figure 1.

Figure 1



Despite their dependence, there is a distinction within assessment between the measurement of individual performances and judgments of competence. Certification, similarly, involves separate processes of generalising and communication. Most crucial for the design of any system of accreditation, however, is the recognition that accreditation is not a mere commentary on performance. It involves judgments of the value of a learner's achievement. In the vocational education and training system judgments may be - and should be - different for different purposes. Too often, however, interpretation is merely an accolade, our grading within a meritocracy.

Interpretation is more that just understanding the words or grades stated in a certificate. In comparing candidates for a job, for example, it is the process of using the information appropriately to inform and improve the decisions made. Common to all interpretation is the use of past events to predict an individual's future performance. The processes of assessment therefore need to generate information which is capable of relating to future events.

CORE SKILLS - A FRAMEWORK FOR DESCRIBING COMPETENCE

In looking at a new area of assessment, it is useful to go back to basics. In terms of Figure 1 there needs to be a linkage between the raw observation or measurement of the individual events of a learner's programme and the eventual interpretation of a certificate plus supporting evidence. The means chosen by the Core Skills Project and adopted by many YTS schemes to varying degrees was to describe skills used in any situation in a way which could be related to any other.

Any performance or competence can be described in a number of ways. Some descriptions are more generally interpretable than others. Consider occupational activities like those with which YTS trainees may be concerned - in reprographics or farm machinery repair or planning a week's menus, for example. Performance or achievement can be described in quite esoteric ways, using the terminology of the particular workplace. Alternatively it can indicate the general applicability of the skills used. Using a more general vocabulary to report achievement does not, of itself, guarantee that the learner has a general command of the skills concerned, but it does give some information about the potential for transfer from one experience to another.

The core skills were defined as being common to a wide variety of tasks and essential to carrying out those tasks. The development involved a considerable challenge to everyday concepts of skill. The core requires that skill is no longer seen only as the practice of subtle crafts of manipulation. Figure 2 (taken from MSC, 1984) shows the core skills list - the descriptive framework. It contains skills of dealing with number, of communication, of problem solving as well as the more obvious practical skills.

Occupational competence demands the practical application of knowledge, concepts or skills which have been acquired elsewhere. The separation, in both education and training, of skill and other learning from application is often an unnecessary one. Reflecting this premise, the core skills are expressed operationally. The constructs are derived more from the analysis of skilled activity than from a study of the nature of human ability.

These skills are to be found in competent performance exhibited by YTS trainees. Analysis of what is needed by employers (and therefore by learners) shows that the core skills can be used to identify many of the critical aspects of competence. There is in this nothing which is peculiar to YTS. The core skills may not be exhaustive in describing competence, but they cast light on a vast number of activities which at present tend to be described only in a job specific or (in educational terms) subject specific way.

THE CORE SKILLS: QUICK REFERENCE LIST

NUMBER

1 **Operating with numbers**
1.1 Count items singly or in batches.
1.2 Work out numerical information.
1.3 Check and correct numerical information.
1.4 Compare numerical information from different sources.
1.5 Work out the cost of goods or services.

2 **Interpreting numerical and related information**
2.1 Interpret numerical data or symbols in written or printed form.
2.2 Interpret diagrams and pictorial representations.
2.3 Interpret scales, dials and digital readouts.
2.4 Identify items by interpreting number, colour, letter codes or symbols.
2.5 Locate places by interpreting number, colour or letter systems.

3 **Estimating**
3.1 Estimate quantity of observed items or materials.
3.2 Estimate quantities required for a process.
3.3 Estimate portions or shares.
3.4 Estimate dimensions of an observed object or structure.
3.5 Estimate weight, volume or other properties.
3.6 Estimate the time needed for an activity.
3.7 Estimate the time an activity has been going on.
3.8 Estimate the rate of use of items or materials.
3.9 Estimate the cost of goods and services.
3.10 Estimate and compare shapes or angles.
3.11 Estimate the size of gaps or holes and the fit of items.
3.12 Estimate required sizes of containers or covering materials.
3.13 Estimate size or shape for the purpose of sorting.
3.14 Estimate settings for tools, equipment, machinery.

4 **Measuring and marking out**
4.1 Measure the dimensions of an object or structure.
4.2 Mark out required dimensions and shape.
4.3 Measure weight, volume or other properties.
4.4 Measure out a required weight or volume.
4.5 Measure the time a process or activity takes.

5 **Recognising cost and value**
5.1 Compare the cost of different goods and services.
5.2 Compare the relative costs and benefits of buying or using goods and services.
5.3 Recognise the value of items in order to take appropriate care of them.

COMMUNICATION

6 **Finding out information and interpreting instructions**
6.1 Find out information by speaking to other people.
6.2 Find out information from written sources.
6.3 Find out information by observing.
6.4 Interpret spoken instructions.
6.5 Interpret written instructions.
6.6 Find out the needs of other people in the workplace.
6.7 Find out the facts about things that have gone wrong.
6.8 Find out the needs of customers and clients.

7 **Providing information**
7.1 Provide information by speaking to other people in the workplace.
7.2 Provide information by speaking to customers and clients.
7.3 Provide information in writing, and by means of tables and diagrams.
7.4 Provide information by demonstrating to other people.
7.5 Provide information by answering questions in the course of the job.
7.6 Provide information by explaining to others about problems that have occurred in the job.

8 **Working with people**
8.1 Notice when to ask other people in the workplace for assistance.
8.2 Ask other people in the workplace for assistance.
8.3 Notice the needs of customers, clients, and other people in the workplace.
8.4 Offer assistance to other people in the workplace.
8.5 React appropriately to requests from other people in the workplace.
8.6 Discuss with other people in the workplace how things are to be done.
8.7 React appropriately to complaints from other people in the workplace.
8.8 Offer assistance to customers and clients.
8.9 React appropriately to requests from customers and clients.
8.10 Converse with customers and clients in order to establish or maintain an appropriate relationship.
8.11 React appropriately to complaints from customers and clients.
8.12 Notice where people behave exceptionally and whether action is required.

PROBLEM SOLVING

9 **Planning: determining and revising courses of action**
9.1 Plan the order of activities.
9.2 Plan who does what and when.
9.3 Plan tools, equipment, machinery, and stock and materials needed for a task.
9.4 Plan the arrangement of items.
9.5 Plan how to communicate for a particular purpose.
9.6 Plan how to present information.
9.7 Plan how to find information.
9.8 Diagnose a fault.
9.9 Plan how to deal with hazards and difficulties that might arise.
9.10 Plan how to deal with things that have gone wrong.

10 **Decision making: choosing between alternatives**
10.1 Decide when action is required.
10.2 Decide which category something belongs to.
10.3 Decide between alternative courses of action.
10.4 Decide how to make the best of an awkward situation.
10.5 Decide on a correct response when accidents or emergencies occur.

11 **Monitoring: keeping track of progress and checking**
11.1 Check that he/she is performing a task to standard.
11.2 Monitor a process or activity.
11.3 Monitor the availability of stocks or materials.
11.4 Check the quality and condition of equipment, materials or products.
11.5 Check written information.
11.6 Monitor the safety of the workplace.
11.7 Notice that things have gone wrong, and that action is required.

PRACTICAL

12 **Preparing for a practical activity**
12.1 Locate the place where work is to be carried out if it is not the usual one.
12.2 Identify or locate: TOOLS, EQUIPMENT,
12.3 Handle, lift or transport: MACHINERY, MATERIALS,
12.4 Check and adjust or clean: STOCK OR ITEMS,
12.5 Arrange for safe and easy working: ANIMALS
12.6 Carry out start-up procedures.
12.7 Adjust heating, lighting, ventilation.
12.8 Check for potential hazards in the work area.
12.9 Carry out health and safety procedures.

13 **Carrying out a practical activity**
13.1 Adopt safe working practices.
13.2 Lift or transport objects or materials.
13.3 Manipulate objects or materials.
13.4 Operate and control or adjust tools, equipment, machinery or instruments.
13.5 Set up, assemble or dismantle equipment, machinery, instruments or products.
13.6 Adopt safe practices in the event of accidents or emergencies.

14 **Finishing off a practical activity**
14.1 Carry out procedures to turn off or hand over: TOOLS, EQUIPMENT, MACHINERY.
14.2 Check products or results of activity for quality and accuracy.
14.3 Carry out procedures for cleaning or routine maintenance.
14.4 Carry out procedures to hand over products or results of activity.
14.5 Carry out procedures to store or return: TOOLS, EQUIPMENT, MACHINERY, MATERIALS, STOCK OR ITEMS, ANIMALS.
14.6 Restock for future requirements if necessary.
14.7 Check for potential hazards in the work area.
14.8 Carry out health and safety procedures.

Youth Training Scheme

It is in one sense easy to reject the use of the core skills or of any other instrument with the same purpose. An institution can adopt a policy of accrediting according to its own lights and letting the world make of it what they will. But it is perverse to do this.

Before looking at how the descriptive power of the core skills can help with assessment in the workplace as part of a larger system of accreditation, it is important to understand the nature of the workplace itself.

CHARACTER OF THE WORKPLACE AS AN ASSESSMENT ENVIRONMENT

To speak of 'the workplace in the singular must be to attempt one of the most gross generalisations ever. Workplaces vary enormously in their organisation, and they present many different problems of access and receptiveness for the organisers of YTS programmes and sandwich courses alike. One of the effects of giving status to the workplace as a learning environment (as, for example, in the definition of work based learning) is a diminishing of any attempt to change it to a 'proper' learning environment. The workplace is worth using because it is 'real' or 'live' or 'down to earth' or 'relevant (choose your own ghastly adjective). It offers learning in its own terms. It is a place of active learning. Trainees/students go there to take part, not to observe as they might at a museum or the zoo.

For the assessor, therefore, the workplace has the potential to provide:

events/instances of performance;

coverage of job competence;

routine criteria of performance;

assessors/reporters.

The greatest value of placements in any kind of programme lies in what they provide that is unique. This is not to discount learning which takes place as effectively in the workplace as in the lecture room. The 'best' place for such learning will often be a matter of economics or individual preference. But the carrying out of a job or a special assignment in the working environment involves rather more skills than can be treated theoretically or in a simulation. The chance to observe these skills is a powerful reason to assess in the workplace.

Competence demonstrated in the workplace is much more than the achievement of required performance in a number of tasks. Mansfield and Mathews (1985) propose a simple typology for the elements of job competence. Three complementary components of job competence are suggested - skills of:

> tasks - skills used in activities which have a definite outcome;
>
> task management - skills used in the organisation of one's own activities in the workplace;
>
> the role/job environment - skills of working with colleagues, customers, clients, of responding to critical factors of cost, time safety.

Organisers of sandwich courses (and not just organisers of placements) have the problem of deciding what the placement period can contribute to assessment. One of the lessons of the Core Skills Project is that the demands of the workplace are not simply an intrusion into an otherwise well organised system of objectives for a programme. The YTS workplace highlights what a great many learners will need to master. Similarly with sandwich courses. The demands of task management, for example, are not a distraction from 'real engineering or business administration. It is the formality of education which is the distraction.

Workplaces therefore are rich in opportunities for learners to practice, enhance and be assessed in all aspects of a job. In the carrying out of assessment, however, workplaces turn out to be:

> noisy (in the informational sense);
>
> full of events which are atypical and from which generalisation is tricky;
>
> as unlike formal examinations and their popular credibility as one could conceive;
>
> unequal in the opportunities they provide for demonstrating competence;
>
> difficult to control for reliability, honesty, bias.

The importance of achievement in the workplace demands that assessment be attempted. These difficulties need to be dealt with. The workplace can never compare for control of assessment with a test environment, and assessment there cannot achieve the conventional rigour which might be desirable. There has to be a reordering of priorities in which the usefulness and criticality of assessment information is played off against, say, reliability.

USING THE CORE SKILLS

The core skills are particularly important in helping to deal with two of the problems which the workplace has as a source of assessment information - difficulty of generalisation and inequality of opportunity. Conventional assessment avoids the problem in this way. It creates a scale of measurement and locates individuals on that scale by means of assessment items which are often quite artificial but are the same for everyone or known or intended to be equivalent. This is a straightforward way of appearing to assess fairly. Generalisation from the assessment tends to be norm related and owes more to belief about the distribution of intelligence than to the requirements of competence in an occupation or academic discipline. The person assessed is rated/graded rather than described.

The approach through the core skills is different.

Consider the performance of some activity. If we are looking at a job or placement, this may involve task skills, task management skills or skills of dealing with the role/job environment. Whatever its make-up, the most straightforward judgment that we can usually make about an activity concerns its outcome, which may be satisfactory or not. Judgments about individual skills employed or knowledge demonstrated involve an inference from
that outcome or may require extensive observation or investigation. Such inference may be idiosyncratic or structured. The core skills are designed to provide structure.

The different activities in which a learner is engaged in a placement can be analysed (often by the learner) for their 'core skill content' - that is for the core skills which are necessary for or tend to be used in each activity. This process is known as core analysis. Competent performance of each activity is evidence of the performance of the individual core skills each activity entails. Performance can therefore be viewed either in activity specific terms or in terms of the more general vocabulary of the core skills.

Schematically, performance reporting takes the form of a grid (see Figure 3), though it could be presented in a variety of textual or diagrammatic ways.

Figure 3

EVENT/ACTIVITY DESCRIPTIONS	CORE SKILLS ENTAILED
indicating constraints, complexity, criteria applied, etc	organised in four core areas, 14 skill groups or otherwise

The 'activities' which form the basis of the assessment tend, within a work placement, to be normal events in the workplace. Special activities can be set up for assessment purposes, of course, and the routine of the workplace can sometimes be interrupted to promote events which otherwise occur infrequently. If, however, the workplace has to be adapted for learning in a major way, the choice of that placement must be questioned.

The reporting of a learner's performance in an activity has two parts. One, in which the learner and his/her immediate supervisor is involved, is the identification of satisfactory performance of the activity. This may be on completion of a task, on completion of a significant number of repetitions of a routine task or (especially in the case of task management or role/job environment types of skill) after a period of time or at an agreed review time.

No attempt is made to describe the activity according to shades of performance. In workplace terms it is satisfactory or not. 'More than satisfactory' is a concept implying inappropriate use of resources or some confusion about the performance criteria which should really apply.

The other part - the inference of core skill performance from successful performance of workplace activity - is something of a culture shock for many assessors. It all seems rather like guesswork. What they forget is how much inference already takes place in assesment processes without any agreed framework to organise the inference. What they also forget is that huge sacrifices of validity, usefulness, immediacy are made in the name of 'reliable' examinations or tests. Nevertheless, the inferential processes involved in core skill assessment require expertise and benefit from collaborative approaches wherever these are possible.

Whereas the learner and supervisor who have first hand knowledge of activity outcomes in the workplace, other people can be involved in the process of core analysis. It is an

advantage if one of these can be someone with responsibility across the whole of the programme, not just the placement. Core analysis should not be confined to the workplace. Other locations for learning have a potential for supporting and enhancing core skill development, and where the programme is conceived in terms of work based learning, it is the core skills which provide the theme common to all three elements described above.

To return to the problems of achieving generalisation and equality of opportunity. Generalisation from performance to competence is made possible by reviewing a variety of instances in which the same core skills are used. This is necessary since the instances are not chosen for their representative value in a classical way. The inference from activity to skills, moreover, is a probabilistic one, and therefore a spread of instances is doubly necessary.

Because the workplace is not structured for assessment purposes, generalisation is not the automatic process it can be with carefully sampled test items and so on. It has to be done with the evidence for each individual to hand. It takes longer. This is the cost of making use of events that may be haphazard but which are unquestionably worth taking into account in the accreditation process.

Equivalence of opportunity can be seen for the whole programme or at least a placement in terms of opportunities to demonstrate performance in core skills. There is no need to devise matched sets of activities. It is worth repeating that, if a placement seems to disadvantage a learner when reviewed in this way, why is it being used?

BROAD PRINCIPLES APPLYING TO THE ACCREDITATION OF WORK BASED LEARNING USING CORE SKILLS

The analytical and descriptive capacity of the core skills enables the significant workplace element within YTS to be part of a coherent accreditation system. There is no reason why this example should not be followed for assessment of students on placement in sandwich courses. The staff development implications are not trivial, and workplace assessment will demand the time of college tutors and placement supervisors.

It might be that an instrument other than the core skills could usefully have the same role, but it would be likely to cover much of the same ground if it were to capture the kinds of learning which are demonstrated in the workplace. The core skills are not just a 'low level' instrument, for all that they were devised initially for YTS. It would also share most of the principles which apply to the use of the core skills:

We can identify within competent behaviour skills which have potential for transfer to other situations. Achievement can be recognised independent of context to a degree.

The 'possession' or 'ownership' of skills is inseparable from their 'application .

Core skills offer a broader, operational definition of skill.

Assessment in the workplace encompasses tasks, task management and dealing with the role/job environment.

A recognition that much learning occurs without any input from educators, and that experience in work placements is useful both for acquiring and demonstrating competence.

The achievement of knowledge, skill, competence is inferred from performance of activities in the workplace.

Assessment is of the worthwhile not the easily measurable.

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